AMENDED CLAIMS

[received by the International Office on 25 July 2005 (07.25.05);
original claims 1-16 replaced by new claims 1-14; (4 pages)]

1. A piezoelectric drive unit for generating a preferably rotating drive movement comprising:
a stator (1), a rotor (2; 5;7) rotatable about a rotational axis (11) with respect to the stator, and drive elements preferably taking the form of several piezoelectric actuators (8),
an annular gap (4') filled with a fluid medium (10) that is formed between the facing surfaces of the stator (1) and the rotor (2; 5;7),
several piezoelectric actuators (8a-8f) arranged adjacent to the gap which, on electrical activation according to a predetermined scheme or a predetermined function, undergo an essentially radial change in length in the direction of the gap (4'), such that the mechanical energy provided by the actuators is transmitted to the fluid medium as flow energy, wherein the flow energy of the fluid medium is transmitted to the rotor and transformed into a rotating drive movement of the rotor (2; 5;7),
characterized in that
the rotor (2; 5;7) is supported in the stator using a hydrodynamic bearing system, wherein the gap (4') forms part of the gap (4) of the hydrodynamic bearing system.

2. A piezoelectric drive unit according to claim 1, **characterized in that** the piezoelectric actuators (8a-8f) are disposed along the circumference of the gap (4').

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3. A piezoelectric drive unit according to one of the preceding claims, **characterized in that** the stator (19) has a collar (20) that acts as a resonator and forms the outer limit of the gap, wherein a piezoceramic ring (21;22;23;24) that comprises several piezoelectric actuators (16;26;27;28) is arranged at the outside circumference of the collar (20).

4. A piezoelectric drive unit according to one of the preceding claims, **characterized in that** the piezoelectric actuators (8a-8f) are disposed on one plane.

5. A piezoelectric drive unit according to one of the preceding claims, **characterized in that** the piezoelectric actuators (8a-8f) are segmented in form.

6. A piezoelectric drive unit according to one of the preceding claims, **characterized in that** a part (5) of the rotor has rib-shaped projections (12) distributed over its circumference which face the gap (4') and are circulated with the fluid medium.

7. A piezoelectric drive unit according to one of the preceding claims, **characterized in that** it is designed as a spindle motor.

8. A piezoelectric drive unit according to one of the preceding claims, **characterized in that** it forms a part of a hard disk drive.

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9. A method for generating a preferably rotating drive movement for a drive unit comprising a stator (1) and a rotor (2;5;7), wherein several piezoelectric actuators (8) are preferably used as drive elements, wherein the mechanical energy provided by the piezoelectric actuators (8a-8f) is transformed into flow energy (hydrodynamic energy) for a fluid medium (10), and the flow energy of the fluid medium is transmitted to the rotor and transformed into a rotating drive movement of the rotor (2;5;7),
characterized in that
the flow energy is generated within a bearing gap (4') that, together with a bearing gap (4), forms a part of a hydrodynamic bearing system and that hydrodynamic pressure is built up in the bearing gap (4,4') through the rotation of the rotor (2;5;7), thus giving the bearing its load-carrying capacity.

10. A method according to claim 9, **characterized in that** the fluid medium is accommodated in the substantially annular gap (4'), wherein the piezoelectric actuators (8a-8f) are arranged and activated such that they generate a defined, directed flow of the fluid medium within the gap (4') and the rotor is set into rotation by the flow.

11. A method according to one of the claims 9 or 10, **characterized in that** the actuators (16;26;27;28) act on an annular resonator (20) and excite it to vibration such that a traveling wave is formed whose mechanical energy is transmitted as flow energy to the fluid medium found in the gap.

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12. A method according to one of the claims 9 to 11, **characterized in that** the flow in the gap (4') is directed transversely to the rotational axis (11) of the drive unit.

13. A method according to one of the claims 9 to 12, **characterized in that** the piezoelectric actuators (8a-8f) are electrically activated according to a predetermined scheme or a predetermined function.

14. A method according to one of the claims 9 to 13, **characterized in that** the piezoelectric actuators (8a+8d, 8b+8e, 8c+8f) located opposite each other with respect to the rotational axis (11) are driven in pairs.

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